

# 北京天华中威科技有限公司

## TSP-120180G3-VD-6 宽带移相器

### 技术说明书



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|    |  |
|----|--|
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50  $\Omega$ 

12 to 18 GHz

**特性**

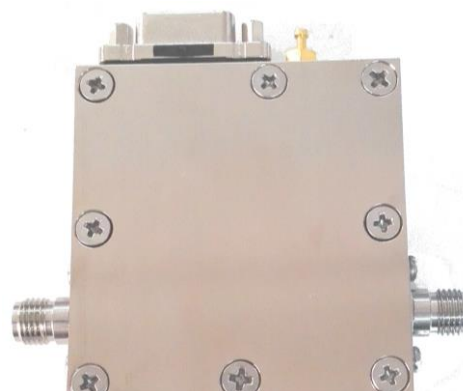
- 宽带: 12 ~ 18 GHz
- 低插入损耗: 6 dB
- 位数 6Bit
- 相位变化范围360°

**应用**

- 电子战接收机
- 气象及军用雷达
- 通讯卫星
- 波束形成模块
- 相取消

**技术指标**

TA=+25°C Vdd=+5V Vc=0/+5V 50 Ohm System



| 指标参数      | 测试条件  | 最小值  | 典型值     | 最大值  | 单位  |
|-----------|-------|------|---------|------|-----|
| 频率范围      |       | 12   | -       | 18   | GHz |
| 插入损耗      | 全频率范围 | -    | 6.0     | 9.0  | dB  |
| 入口/出口回波损耗 | 全频率范围 | -    |         | -10  | dB  |
| 位相位误差     | 全频率范围 | -    | +/- 5.0 | -    | deg |
| 均方值误差     |       | -6   |         | +12  | deg |
| 输入压缩 P1dB |       | -    | 10      | -    | dBm |
| 位控制电压     |       | L/0V |         | H/5V | V   |
| 电压/电流     | 5 V   | -    | -       | 20   | mA  |



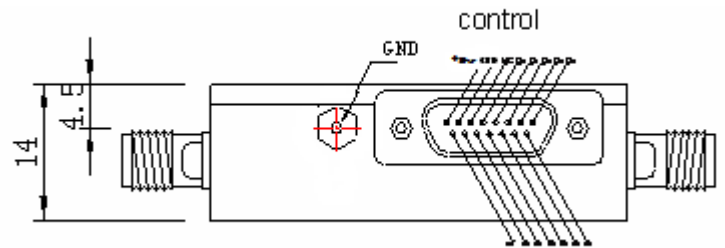
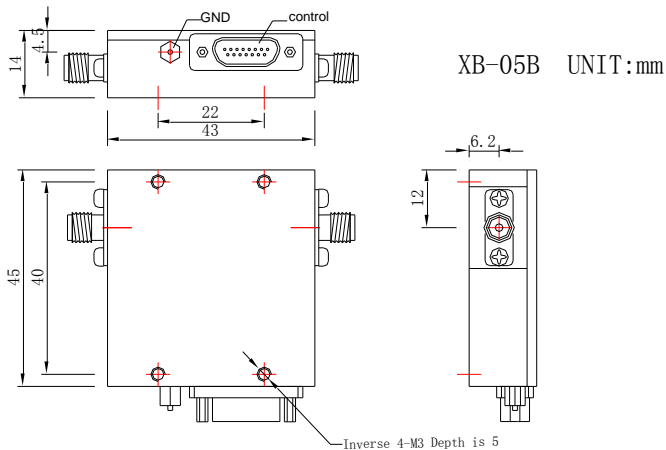
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外形尺寸图

控制图



极限参数

|           |                |
|-----------|----------------|
| 操作温度      | -40°C to 70°C  |
| 储存温度      | -55°C to 100°C |
| 电源电压(max) | 5V             |
| 控制电压(max) |                |
| 最大入口功率    | 10 dBm         |

| State   | Voltage           |
|---------|-------------------|
| Low(0)  | 0 to +0.5V        |
| High(1) | +3 to +5V(Note 5) |

Note 5: 内置上拉电阻 (约500 kΩ), 悬空时代表High

超出该极限值有可能对器件造成损坏!

典型曲线图

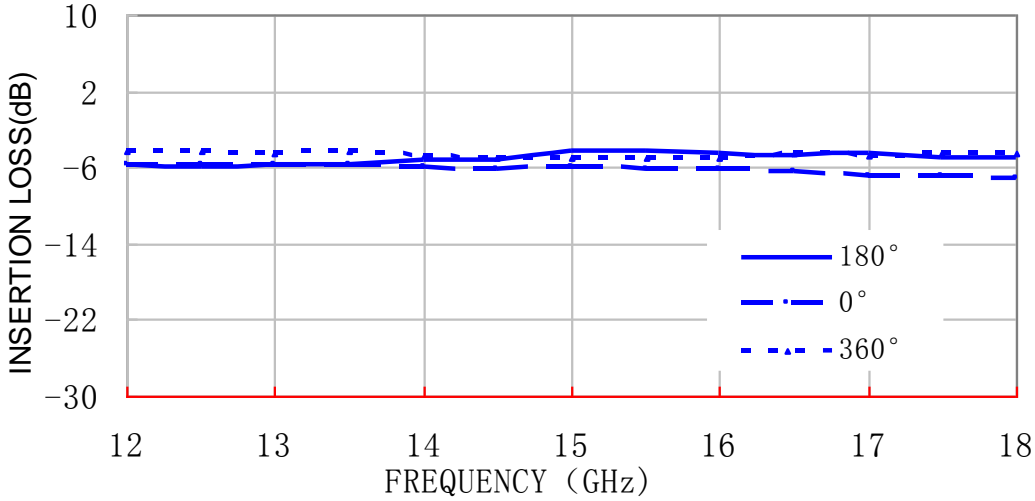
| Control Voltage Input |    |    |    |    |    | Phase Shift<br>(Degrees)<br>RFIN -<br>RFout |
|-----------------------|----|----|----|----|----|---|
| D5                    | D4 | D3 | D2 | D1 | D0 |   |
| 1                     | 1  | 1  | 1  | 1  | 1  | Reference*                                  |
| 1                     | 1  | 1  | 1  | 1  | 0  | 5.625                                       |
| 1                     | 1  | 1  | 1  | 0  | 1  | 11.25                                       |
| 1                     | 1  | 1  | 0  | 1  | 1  | 22.5  |
| 1                     | 1  | 0  | 1  | 1  | 1  | 45.0  |
| 1                     | 0  | 1  | 1  | 1  | 1  | 90.0  |
| 0                     | 1  | 1  | 1  | 1  | 1  | 180.0                                       |
| 0                     | 0  | 0  | 0  | 0  | 0  | 354.375                                     |



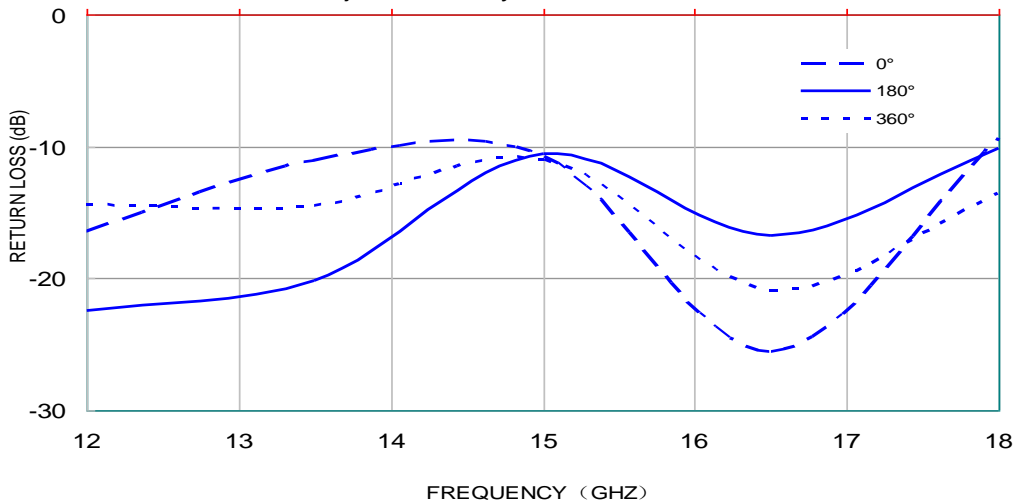
50  $\Omega$

12 to 18 GHz

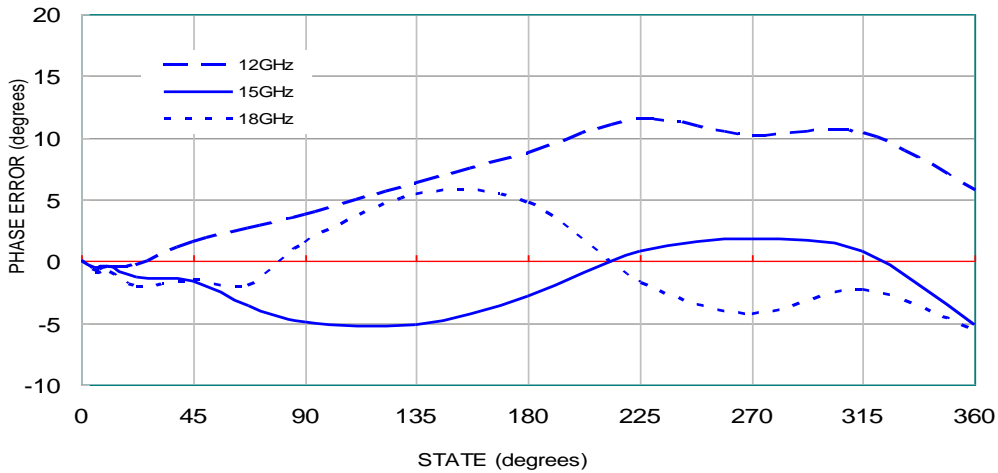
Insertion Loss, Major States Only



Return Loss, Major States Only



Phase Error vs. State



测试数据记录



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同轴

数字移相器

TSP-120180G3-VD-6

50 Ω

12 to 18 GHz

| Theoretical Phase (Degree) | input power (dBm) | Insertion Loss (dB) at middle Frequency (15GHz) | Return Loss (dB) at middle Frequency (15GHz) | Phase Degree (Degree) |        |        |
|----------------------------|-------------------|---|--|-----------------------|--------|--------|
|                            |                   |   |  | 12G                   | 15G    | 18G    |
| Ref                        | 0                 | -6.00   | -14.20                                       | Ref                   | Ref    | Ref    |
| 5.625                      | 0                 | -6.00   | -13.50                                       | 5.90                  | 5.50   | 6.00   |
| 11.25                      | 0                 | -6.00   | -13.10                                       | 12.00                 | 10.80  | 11.60  |
| 22.50                      | 0                 | -6.00   | -12.20                                       | 23.20                 | 20.80  | 22.40  |
| 45.00                      | 0                 | -6.00   | -10.90                                       | 46.80                 | 40.90  | 45.20  |
| 90.00                      | 0                 | -5.90   | -10.00                                       | 91.90                 | 80.50  | 89.60  |
| 180.00                     | 0                 | -4.40   | -17.90                                       | 192.20                | 182.10 | 188.60 |
| 354.375                    | 0                 | -3.50   | -19.50                                       | 369.30                | 359.00 | 356.80 |



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